Advances in Bioresearch
Adv. Biores., Vol 12 (1) January 2021: 36-42

Print ISSN 0976-4585; Online ISSN 2277-1573
Journal's URL:http://www.soeagra.com/abr.html
CODEN: ABRDC3
DOI: 10.15515/abr.0976-4585.12.1.3642

Advances in Bioresearch

ORIGINAL ARTICLE

Quality of Sleep and Sleep Disorders among Medical Students at a Private Medical College in Lahore, Pakistan

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ABSTRACT
First year medical students are introduced in to a novel surrounding and in an overzealous attempt to fit in, accumulate great degrees of stress. Whilst various physical and mental parameters of health have already been assessed, it is important to assess another essential and overlooked aspect of their health too; sleep quality. The objective of this study is to assess the quality of sleep and sleep disorders of first year medical students and to assess various possibilities that could be the reason for their impaired sleep (if any). All healthy 1st year medical students from CMH LMC between the ages of 17-23 were included in the study. Pre-tested, and self-administered questionnaires, containing 3 basic sections; a bio-data form, Pittsburgh Sleep Quality Index, and a Sleep Disorders Questionnaire were distributed among the participants. 235 forms were distributed, and 221 were completely filled; 63.3% of participants were female, and 36.7% were male. The mean global PSQI score was 7.59 ± 2.77. 88.6% of participants were 'poor' sleepers (global PSQI > 5). There was no significant correlation with gender (p value=0.470), and social background (p value=0.954). 52.9% of students suffer from insomnia or require further evaluation for insomnia, and 46.6% suffer from a circadian rhythm disorder. Our study not only indicates the presence of sleep disorder and poor sleep quality amongst students, but also the alarming severity of such disorders. Significant steps must be undertaken to improve upon the sleep hygiene of students.
Key Words: *Sleep Quality, 1st year medical students, Pittsburgh Sleep Quality Index, Sleep Disorders, Insomnia*

Received 24.10.2020 Revised 21.11.2020 Accepted 07.01.2021

How to cite this article:
A R Arshad, M H Khan, F Hasan, S K Khan, F Ijaz, R K Aftab. Quality of Sleep and Sleep Disorders among Medical Students at a Private Medical College in Lahore, Pakistan. Adv. Biores. Vol 12 [1] January 2021. 36-42

INTRODUCTION

Sleep quality is defined as one's satisfaction of the sleep experience, integrating aspects of sleep initiation, sleep maintenance, sleep quantity, and refreshment upon awakening. Whilst, it has been reported that a good quality of sleep is essential to the memory process [1], almost half of university students experience poor sleep quality [2]. This incidence can be attributed to technology, particularly the use of it at bedtime, which has been proven to decrease sleep quality [3], as well as the consumption of tobacco and an unhealthy lifestyle [4]. But perhaps the most predominant factor and one particularly applicable to medical students is "Academic Stress". Considerably higher levels of stress and poor sleep quality have been reported in medical students as compared to other professional students [5], so much so that 77% of Pakistani medical students have reported poor sleep quality [6].

According to the Pakistan medical system, a Bachelor in Medicine & Bachelor in Surgery (MBBS) degree consists of two preclinical years and three clinical years. A Bachelor in Dental Sciences (BDS) degree consists of 2 preclinical and 2 clinical years. Whilst first year medical students have just made the life changing experience of just entering medicine, they haven't been the subject of many researches and are thus theoretically most prone to stressors; Mojtaba *et al* speak in their study that no extensive study on the sleep condition of medical students at pre-clinical stages has been carried out [7], but they fail to make any comparison between the individual preclinical medical years. Another study conducted in

Brazil was more specific and reported first and second year medical students having greater daytime dysfunction and sleep quality worse than medical students in other years of study [8]. AminaNadeem et al results were even more specific; they suggested that the mean nocturnal sleep period was significantly shorter for 1st year medical students than for 2nd year medical students [9]. Another study conducted by Jaydeep et al in which 83% of students reported that they had experienced a change in sleeping pattern after getting admission in MBBS. However they only had a sample size of 100 students [10].
Given the lack of current literature available on first year medical students, it is imperative that we study a rather important and overlooked aspect of their health; their sleep. Sleep is essential for their mental functioning especially in a field as stressful as medicine, and it is important to target the issue and counsel students as early as their first year of study. Our study is unique because it will also shed light on sleep disorders The main aim of this research thus is to study the prevalence and severity of poor sleep quality and sleep disorders amongst 1st year medical students.

MATERIAL AND METHODS

Sample Frame

This study was conducted at CMH Lahore Medical and Dental College, after being approved by the Ethical Review Committee. The study population comprised of 221 undergraduate healthy, newly enrolled 1st year Medical students of MBBS and BDS. Informed written consent was taken from every participant at the beginning of the study.

Recruitment Methods

All healthy 1st year medical students between the ages of 17-23 were included in the study. Students from both MBBS and BDS were invited to participate in our study. Students who declined the invitation to participate, or were clinically diagnosed with a sleep disorder (apnea, insomnia), or students medicating themselves already for a sleep disorder were excluded from the study.

Sample Size Calculation

The sample size was calculated to be 221 students using the following formula (based on central limit theorem) $n = Z^2 1 - {}^{\alpha}/2\ p(1-p) / d^2$ with 95% confidence interval and 5% error margin.

Data Collection

Pre-tested, and self-administered questionnaires designed in English language were administered on paper. The first section contained questions pertaining to the demographics of the subject. The latter portion of this designed questionnaire included the Pittsburgh sleep quality index (PSQI) [11] and sleep disorders questionnaire (SDQ) [12].

Data Analysis

The data was analysed using SPSS 20.0. Chi-square test was used to compare the frequencies of groups. Qualitative variables were presented in the form of frequencies and percentages. Results were expressed in the form of tables. P value <0.05 was taken in consideration to be significant

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RESULTS

Demographics

The total number of questionnaires distributed was 235. There were 10 incompletely filled questionnaires and questionnaires that refused consent and 4 questionnaires that included a specified diagnosed sleep disorder. In lieu of our exclusion criteria, we excluded these 14 questionnaires and obtained 221 completely filled questionnaires (questionnaire turnout = 94 %). The number of completed questionnaires comprised of 146 students from MBBS (66.1%), and 75 students from BDS (33.9%). Almost twice as many females as males participated in the study; 140 female students (63.3%) to 81 male students (36.7%). The demographic information of participants is presented in (Table 1).

Table I: Basic characteristics of study participants

Characteristic	Participants (n=384) No. (%)
Sex	
Male	81 (36.7%)
Female	140 (63.3%)
Age (years)	
18	55 (24.9%)
19	110 (49.8%)
20	51 (23.1%)
21	5 (2.3%)
Discipline	
MBBS	146 (66.1%)
BDS	75 (33.9%)
Social Background	
Rural	11 (5%)
Semi-Urban	36 (16.3%)
Urban	174 (78.7%)
Hostelite/Day Scholar/Medical Cadet	
Hostelite	96(43.4%)
Day Scholar	95 (43.0%)
Medical Cadet	30 (13.6%)

Pittsburgh Sleep Quality Index

The mean PSQI for the total population was 7.59 ± 2.77. 196 students (88.6%) had a global PSQI score > 5; indicating them to be "Poor sleepers". Participants, however, when asked to classify their sleep according to their own interpretation, mostly classified it as good; 48.9% classified their sleep as "Fairly Good", and only 29.9% classified their sleep as "Fairly Bad", whilst only 5.9% classified their sleep as "Very bad".

The majority of students reported no difficulties in being able to fall asleep (Table 2), but the number of actual hours of sleep in a night was reported to be less than 7 hours in 87.6% of participants (Table 2). 197 (87.2%) of participants denied taking any medication to help them sleep (Table 2), and 79.6% of participants reported trouble staying awake during various activities in the day (Table 2)

There was significant correlation between the degree (MBBS and BDS) and global PSQI score (p value=0.027). However, no such correlation existed between global PSQI score and gender (0.470), age, and social background (p value=0.954).

Table 2: Frequency distribution of sleep quality measured by PSQI

1.	10-11 pm	11-12 am	12-1 am	1-2 am	2-3 am	3-4 am
What time have you usually gone to bed in the last month?	9.5%	14.9%	25.3%	15.8%	24.0%	10.4%

2.	<15 minutes	16-30 minutes	31-60 minutes	>60 minutes
How long (in minutes) has it taken for you to fall asleep?	38.9%	42.1%	15.4%	3.6%

3.	4-5 am	5-6 am	6-7 am	7-8 am	8-9 am	9-10 am
When have you usually gotten up in the morning?	3.6%	11.8%	26.2%	57.0%	.5%	.9%

4.	>7	6-7	5-6	<5
How many hours of actual sleep do you get in a night?	10.4%	29.0%	34.8%	25.8%

5. During the past month, how often have you had trouble sleeping because you…	Not During the Past month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times a week (3)
a. Cannot go to sleep within 30 minutes	33.9%	21.7%	21.7%	22.6%
b. Wake up In the middle of the night or early morning	40.7%	27.1%	19.5%	12.2%
c. Have to get up to use the bathroom	52.5%	29.0%	12.7%	5.9%
d. Cannot breathe comfortably	84.6%	7.7%	5.9%	1.8%
e. Cough or snore badly	89.6%	5.4%	3.6%	1.4%
f. Fell too cold	56.1%	24%	14%	5.9%
g. Feel too hot	52.5%	27.6%	14.9%	5.0%
h. Have bad dreams	44.8%	30.8%	16.7%	7.7%
i. Have pain	65.2%	22.2%	7.7%	4.5%
6. During the past month, how often have you taken medicine (prescribed as "over the counter" to help you sleep?	89.1%	3.6%	3.2%	4.1%
7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activities?	18.6%	18.6%	26.2%	36.7%
8. During the past month, how much of a problem has it been for you to keep enthusiasm to get things done?	14.9%	35.7%	31.7%	17.6%
	Very good (0)	Fairly Good (1)	Fairly Bad (2)	Very Bad (3)
9 .During the past month, how would you rate your sleep quality overall?	15.4%	48.9%	29.9%	5.9%
	Yes	No		
Do you have a roommate?	68.8%	31.2%		

Sleep Disorders Questionnaire

88.2% of participants reported having no underlying medical condition that disrupted their sleep (Table 3). Interesting, when asked if they thought their sleep schedule was regular, the greatest percentage answered "always" (24%); Only 24 students (10.9%) of students thought their sleep schedule was "never" regular (Table 3).

Table 3: Frequency distribution to questions of the Sleep Disorders Questionnaire (SDQ)

		Grading Scale				
		Never (1)	Rarely (2)	Occasionally (3)	Most Nights/ Days (4)	Always (5)
1	Do you have trouble falling asleep?	14.5%	44.3%	22.6%	13.1%	5.4%
2	Do you have trouble staying asleep?	32.1%	34.8%	21.7%	5.0%	6.3%
3	Do you take anything to help you sleep?	88.7%	9.0%	2.3%	0.0%	0.0%
4	Do you have any medical conditions that disrupt your sleep?	88.2%	6.3%	3.6%	.9%	.9%
5	Have you lost interest in hobbies or activities?	19.9%	29.9%	27.6%	11.8%	10.9%
6	Do you feel sad, irritable, or hopeless?	17.2%	25.8%	31.2%	12.7%	13.1%
7	Do you feel nervous or worried?	10.9%	23.5%	33.5%	18.6%	13.6%
8	Do you think something is wrong with your body?	38.9%	29.9%	15.4%	8.6%	7.2%
9	Is your sleep schedule irregular?	10.9%	19.9%	23.5%	21.7%	24.0%

10	Are your legs restless and/or uncomfortable before bed?	31.2%	28.1%	18.6%	13.6%	8.6%
11	Have you been told that you are restless or that you kick your legs in your sleep?	66.1%	18.6%	6.8%	5.0%	3.6%
12	Do you have any unusual behaviours or movements during sleep?	65.2%	20.8%	7.7%	3.2%	3.2%
13	Do you snore?	81.0%	13.1%	4.5%	.5%	.9%
14	Has anybody said you stop breathing, gasp, snort, or choke during your sleep?	86.9%	9.5%	3.2%	0%	.5%
15	Do you have difficulty staying awake during the day?	10.4%	23.5%	32.1%	16.7%	17.2%

117 (52.9%) of students suffered from insomnia or required the need for further psychiatric evaluation for their insomnia (Table 4). 42.1% of participants required screening for other psychiatric disorders (Table 4) and 46.6% suffered from a circadian rhythm disorder (Table 4).

Table 4: Interpretation of Sleep Disorders Questionnaire (SDQ)

		Percentage %
Does the subject suffer from Insomnia and does Insomnia require further evaluation?	No	47.1
	Yes	52.9
Does the subject require further screening for psychiatric disorders?	No	57.9
	Yes	42.1
Does the subject have an underlying somatoform disorder which requires specific treatment?	No	69.2
	Yes	30.8
Does the subject have a circadian rhythm disorder?	No	53.4
	Yes	46.6
Is restlessness contributing to subject's symptoms of insomnia or non-restorative sleep?	No	77.4
	Yes	22.6
Does the subject have Restless Leg Syndrome?	No	80.1
	Yes	19.9
Does the subject have a Periodic Limb Movement Disorder?	No	91.0
	Yes	9.0
Should the movements of the subject raise concern?	No	93.2
	Yes	6.8
Does the subject require further evaluation for Sleep Apnea?	No	95.0
	Yes	5.0

DISCUSSION

The findings from this study suggest that a large percentage of first year medical students suffer from poor sleep quality and various sleep disorders. Overall, a very high majority of student were very poor sleepers. This was supported by previous studies [13-17]. Despite 88.6% of the students being "poor" sleepers, the vast majority (48.9%) still rated their overall sleep during the past month as "Fairly good". Whilst it has been suggested that there is no correlation between sleep quality and sleep hygiene awareness [18, 19], it is worthwhile to ponder over the existence of this disparity. This could be due to students subconsciously correlating the regularity of their sleep to the rating of their sleep. This notion is supported by AminaNadeem *et al* [10], where the majority choice was also "Fairly good", but around half of those students who selected so actually turned out to be poor sleepers. However, it also informs us that there is a lack of understanding of medical students of their own sleep health. This accentuates the need to exercise counselling and awareness programs to educate students.

The frequency of poor sleep observed in our study (88.6%) was substantially higher than that calculated in another study (40%) [15]. However, it is to be noted that their study included only MBBS students from all five years of medical study. Our study meanwhile focused solely on students from first year and included both MBBS and BDS students. This allows us thus to postulate the presence of certain factors specific for first year that account for this disparity in sleep quality.

Our study indicated a very high percentage of students suffering from insomnia or whose insomnia required further evaluation (52.9%). These values are much higher than those noted in other studies on medical students; 5% [20] and 1% [10]. Because 46.6% of students had an underlying circadian rhythm disorder, it can be postulated that a circadian rhythm disorder is the cause of this. Because insomnia can be so deleterious to the general health of the students [16], it is imperative it is dealt with seriously, thereby

necessitating the need for psychiatric sessions for students and the need for further evaluative to further assess the insomnia and other sleep disorders of these students.

Whilst our study has explored new avenues population that have not been researched before in a specific medical student population, there are a few limitations to our study. We have only studied the sleep quality and sleep behaviours among first year medical students at a single institute. To generalize our findings to all first year medical students at private medical colleges, we need to study first year medical students in other medical institutes as well. It is also important to include first year students from the allied medical health sciences as well so as to make an overall comparison.

CONCLUSION

Medical students are already under great stress as compared to their non-medical counterparts, but the presence of such poor sleep quality and presence of sleep disorders like insomnia at such an early stage is truly alarming. Immediate and effective steps must be taken to improve upon this overlooked health aspect of students.

REFERENCES

1. Vyazovskiy VV. (2015). Sleep, recovery, and metaregulation: explaining the benefits of sleep. Nat Sci Sleep. 7:171-184. doi: 10.2147/NSS.S54036
2. Oginska H, Pokorski J. (2006). Fatigue and mood correlates of sleep length in three age-social goups: school children, students, and employees. Chronobiol Int. 23(6):1317–1328. https://doi.org /10.1080/ 0742052 0601089349
3. Fuller C, Lehman E, Hicks S, Novick MB. (2017). Bedtime Use of Technology and Associated Sleep Problems in Children. Glob Pediatr Health. 4:2333794X17736972. https://doi.org/10.1177/2333794X17736972.
4. Araújo MF, Freitas RW, Lima AC, Pereira DC, Zanetti ML, Damasceno MM. (2014). Health indicators associated with poor sleep quality among university students.Rev Esc Enferm USP.48(6):1085-1092. http://dx.doi.org/10.1590/S0080-623420140000700017.
5. Jafri SA, Zaidi E, Aamir IS, Aziz HW, Din I, Shah MAH. (2017). Stress Level Comparison of Medical and Non-medical Students: A Cross Sectional Study done at Various Professional Colleges in Karachi, Pakistan. ActaPsychopathol. 3:2. doi: 10.4172/2469-6676.100080.
6. Waqas A, Khan S, Sharif W, Khalid U, Ali A. (2015). Association of academic stress with sleeping difficulties in medical students of a Pakistani medical school: a cross sectional survey. *PeerJ*.3:e840. doi:10.7717/peerj.840.
7. Rezaei M, Khormali M, Akbarpour S, Sadeghniiat-Hagighi K, Shamsipour M.(2018). Sleep quality and its association with psychological distress and sleep hygiene: a cross-sectional study among pre-clinical medical students. *Sleep Sci*. 11(4):274-280. doi:10.5935/1984-0063.20180043
8. Corrêa CC, Oliveira FK, Pizzamiglio DS, Ortolan EVP, Weber SAT. (2017). Sleep quality in medical students: a comparison across the various phases of the medical course. *J Bras Pneumol*.;43(4):285-289. doi:10.1590/S1806-37562016000000178
9. Nadeem DA, Cheema M, Naseer M, Javed H. (2018). Assessment Of Sleep Quality And Patterns Suggestive Of Somniopathies Among Students Of Army Medical College, Rawalpindi. Pak Armed Forces Med 68 (1): 143-148.
10. Devaliya JJ, Chawada BL. (2017). A Cross-Sectional Study of Change in Sleep Pattern among First year Students of a Medical College in Western India. Indian Journal of Forensic and Community Medicine, October-December ;4(4):270-273. DOI: 10.18231/2394-6776.2017.0059
11. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Res*. 28(2):193-213. https://doi.org/10.1016/0165-1781(89)90047-4
12. Douglass AB, Bornstein R, Nino-Murcia G, Keenan S, Miles L, Zarcone VP, et al. (1994). The Sleep Disorders Questionnaire. I: Creation and multivariate structure of SDQ. Sleep. ;17(2):160-167. doi: 10.1093/sleep/17.2.160. .
13. Surani AA, Zahid S, Surani A, Ali S, Mubeen M, Khan RH. (2015). Sleep quality among medical students of Karachi, Pakistan. *J Pak Med Assoc*. 65(4):380-382.
14. Nadeem A, Cheema MK, Naseer M, Javed H. (2018). Comparison of quality of sleep between medical and non-medical undergraduate Pakistani students. *J Pak Med Assoc*. 68(10):1465-1470.
15. Rezaei M, Khormali M, Akbarpour S, Sadeghniiat-Hagighi K, Shamsipour M.(2018). Sleep quality and its association with psychological distress and sleep hygiene: a cross-sectional study among pre-clinical medical students. *Sleep Sci*. 11(4):274-280. doi:10.5935/1984-0063.20180043.
16. Ibrahim NK, Badawi FA, Mansouri YM, Ainousa AM, Jambi SK, Fatani AN, et al. (2017). Sleep Quality among Medical Students at King Abdulaziz University: A Cross-sectional Study. J Community Med Health Educ. 7: 561. doi: 10.4172/2161-0711.1000561
17. Lohitashwa, R., Kadli, N., Kisan, R., A, S., &Deshpande, D.(2017). Effect of stress on sleep quality in young adult medical students: a cross sectional study. *International Journal of Research in Medical Sciences. 3*(12), 3519-3523. doi:10.18203/2320-6012.ijrms20151391

18. Alshahrani M, Al Turki Y. (2019). Sleep hygiene awareness: Its relation to sleep quality among medical students in King Saud University, Riyadh, Saudi Arabia. J Family Med Prim Care. 28;8(8):2628-2632. doi: 10.4103/jfmpc.jfmpc_359_19.
19. Suen LK, Tam WW, Hon KL. (2010). Association of sleep hygiene-related factors and sleep quality among university students in Hong Kong. Hong Kong Medical Journal = Xianggangyixuezazhi.16(3):180-185.
20. Goel N, Malhotra V, Tripathi Y. (2016). Sleep habits among first year medical students. J. Evolution Med. Den. Sci;5(38):2276-2278. DOI: 10.14260/jemds/2016/529